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EXAMINER	
SILVER, DAVID	
ART UNIT	PAPER NUMBER
2128	

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12/30/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/828,465	FULTHEIM ET AL.	
	Examiner	Art Unit	
	DAVID SILVER	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 October 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Response: 35 U.S.C. § 102 / 103

1. **Examiner Response:**

Applicants' arguments are moot in view of new ground of rejection presented below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. Claims 1-4, 9-16, 22-30, and 32-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto **(US 5829041)**, in view of VMware Workstation "User's Manual" Version 3.2, ("VMware"). Okamoto discloses: 1. (currently amended) A method for executing a software application in a plurality of computers having respective hardware resources said hardware resources comprising a respective memory and a respective I/O device **(Fig 3 with emphasis on Computer 1 and Computer 2, as well as the implied networking between the computers; col: 2 line: 8-15)**,

wherein said computers include a first computer and a second computer that intercommunication over a network **(col: 2 line: 8-15)**, comprising the steps of:

running at least a first virtual machine implementer and a second virtual machine implementer on said first computer and said second computer, using said respective memory, wherein said first and second virtual machine implementers run separately and independently of one another on said first and second computers, respectively **(col: 5 line: 66 to col: 6 line: 7; the OS functions as the virtual machine implementer)**.

Okamoto however does not expressly disclose:

executing a virtual machine on said computers, wherein sharing said virtual machine is shared between said first virtual machine implementer and said second virtual machine implementer using said respective I/O device in each of said first computer and said second computer to intercommunicate between said first computer and said second computer, and a guest operating system runs over said shared virtual machine.

Although Okamoto discloses executing a program executing transparently on the distributed system **(col: 5 line: 4-14)**, and functionally said collection of computers would function and the individual VM implementers (Oss) would function as a virtual machine, in order to make the record abundantly clear, VMware is used to show that such a program as disclosed by Okamoto could be VMware's Workstation (Virtual Machine), and such program would be distributed among the computers in the fashion as disclosed by Okamoto, also that such program would execute a virtual machine with a guest operating system.

Specifically, VMware discloses executing a program which creates a virtual machine and contains a guest operating system. The combination of the two references would yield predictable results **(VMWare: page 21)**.

It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to combine the references in order to achieve the various goals of virtual computing, such as, for example, sandboxing and security afforded to virtual environments. Further motivations include crash-resistance and crash-recovery, which would benefit from the VM environment. In fact, Okamoto provides clear motivation showing that a single program (VMware's Virtual Machine, for example), creates "easier" **(col: 5 line: 36-42)**.

The combination teaches: 2. (previously presented) The method according to claim 1, further comprising step of running said software application over said guest operating system, so that commands invoked by said software application are monitored or emulated by said first virtual machine implementer and said second virtual machine implementer on said first computer and said second computer, while said

hardware resources of said first computer and said second computer are shared by communication over said network **(VMWare: page 21; this is inherent as the commands executed would be loaded into a single aggregated virtual space, and then properly executed with the respective computer and resource. This is evidenced by Okamoto: col: 5 line: 66 to col: 6 line: 7)**.

The combination teaches: 3. (original) The method according to claim i, wherein at least one of said first virtual machine implementer and said second virtual machine implementer is a virtual machine monitor **(Okamoto: col: 5 line: 66 to col: 6 line: 7; this is the function of Okamoto's OS)**.

The combination teaches: 4. (original) The method according to claim i, wherein at least one of said first virtual machine implementer and said second virtual machine implementer is an emulator **(Okamoto: col: 5 line: 66 to col: 6 line: 7 Okamoto's OS emulates a memory space that does not exist)**.

9. (previously presented) The method according to claim i, further comprising the steps of:

providing a management system for said first virtual machine implementer and said second virtual machine implementer to control said first computer and said second computer, respectively, wherein said management system comprises a wrapper for receiving calls to a device driver from said first virtual machine implementer, said wrapper invoking said device driver according to a requirement of said first virtual machine implementer **(col: 16 line: 52-62: the OS functions as the management and the VMI, which must use device drivers to communicate with the memory of the first and second computer, and consequently functions as a wrapper for calls made to the virtual memory space, and direct them to the actual device drivers and actual memory space)**.

VMware discloses: 10. (previously presented) The method according to claim 9, further comprising the step of providing a virtual PCI controller for said management system to control a physical PCI controller in one of said computers **(VMware page 206; 247 - bottom)**.

VMware discloses: 11. (previously presented) The method according to claim 9, further comprising the step of providing a virtual DMA controller for said management system to control a physical DMA controller in one of said computers **(VMware page 149)**.

VMware discloses: 12. (previously presented) The method according to claim 11, further comprising the steps of:

providing a virtual PCI controller to control a physical PCI controller in one of said computers; and during a bootup phase of operation scanning a device list with said virtual PCI controller to identify devices having on-board DMA controllers **(VMware page page 149-150 top)**.

Okamoto discloses: 13. (previously presented) The method according to claim 1, further comprising the steps of:

with said first virtual machine implementer and said second virtual machine implementer maintaining mirrors of a portion of said respective memory that is used by said guest operating system in each of said computers; write-invalidating at least a portion of a page of said respective memory in one of said computers; and transferring a valid copy of said portion of said page to said one computer from another of said computers via said network **(Okamoto: col: 11 line: 59 to col: 12 line: 10)**.

As per claims 14-16, 22-30, 32-45, note the rejection of claims 1-4, 9-13 above. The Instant Claims recite substantially same limitations as the above-rejected claims and are therefore rejected under same prior-art teachings.

3. Claims 5-8, and 17-21, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto **(US 5829041)**, in view of VMware Workstation "User's Manual" Version 3.2, ("VMware") in view of Altman **(US 20040054517)**.

As per claim 5, the combination of Okamoto and VMware fully disclose claim 1. The combination however does not expressly disclose: at least said first computer comprises a first virtual node comprising a first physical CPU of said first computer and a second virtual node comprising a second physical CPU of said first computer.

Altman however discloses said feature **(para 0046)**.

It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to combine the references in order to support multiprocessor environments, which are typically faster and cost less as technology advances. Using multiple cores / multiple processors allows for more compact machines which allows for more space to be used for additional computers, or other necessary features (such as cooling fixtures).

As per claims 6-8, note the rejection of claim 5 above. The Instant Claims recite substantially same limitations as the above-rejected claim and are therefore rejected under same prior-art teachings.

As per claims 17-21, note the rejection of claims 5-8 above. The Instant Claims recite substantially same limitations as the above-rejected claims and are therefore rejected under same prior-art teachings.

As per claim 31, note the rejection of claim 5 above. The Instant Claim recites substantially same limitations as the above-rejected claim and is therefore rejected under same prior-art teachings.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Silver whose telephone number is (571) 272-8634. The examiner can normally be reached on Monday thru Friday, 10am to 6:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on 571-272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/David Silver/

Examiner, Art Unit 2128